

**Wells Gray Community Forest
Forest Stewardship Plan
CFA_K2A**

Final

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TABLE OF CONTENTS

1. DEFINITIONS AND INTERPRETATION..... 1

 1.1 DEFINITIONS 1

 1.2 DEFINITIONS UNDER ENACTMENTS..... 1

2. SUBMISSION DATE, TERM AND COMMENCEMENT DATE OF THIS FSP 2

 2.1 SUBMISSION DATE 2

 2.2 TERM 2

 2.3 COMMENCEMENT DATE 2

3. APPLICATION OF THIS FSP 2

 3.1 FSP HOLDER 2

 3.2 APPLICATION OF THIS FSP (FRPA s. 3(4)) 2

4. FOREST DEVELOPMENT UNITS IN EFFECT ON THE DATE OF SUBMISSION OF THIS FSP (FPPR S. 14(1)(B)) 2

 4.1 ITEMS IDENTIFIED IN THE FDU 3

5. RESULTS OR STRATEGIES..... 3

 5.1 INCORPORATION OF LRMP OBJECTIVES INTO THE FSP 3

 5.2 SOIL MANAGEMENT AND CONSERVATION OBJECTIVE..... 3

 5.3 WATER OBJECTIVES 4

 5.3.1 *Community Watersheds*..... 4

 5.3.2 *General Water Resources*..... 5

 5.4 RIPARIAN MANAGEMENT OBJECTIVES 5

 5.4.1 *Lakeshore Management* 5

 5.4.2 *General Riparian Management*..... 6

 5.5 BIODIVERSITY OBJECTIVES..... 7

 5.5.1 *General Biodiversity* 7

 5.5.2 *Landscape Level Biodiversity*..... 8

 5.5.3 *Stand Level Biodiversity*..... 9

 5.6 RECREATION OBJECTIVES..... 9

 5.6.1 *Recreation Sites and Trails*..... 9

 5.7 WILDLIFE OBJECTIVES 10

 5.7.1 *Moose*..... 10

 5.7.2 *Lewis’s Woodpecker* 11

 5.7.3 *Badger*..... 11

 5.8 VISUAL OBJECTIVES..... 12

 5.8.1 *Visually Sensitive Areas in the Headwaters Forest District (Kamloops TSA)*..... 12

 5.8.2 *Areas Outside Visually Sensitive Areas within the Kamloops TSA* 14

 5.9 CULTURAL HERITAGE OBJECTIVES 15

 5.10 ARCHAEOLOGICAL RESOURCES 16

 5.11 RANGE 16

 5.12 RANGE BARRIERS AND INVASIVE PLANT MEASURES..... 17

 5.12.1 *Natural Range Barriers* 17

 5.12.2 *Invasive Plants* 17

6. STOCKING STANDARDS 18

 6.1 GENERAL STANDARDS 18

 6.1.1 *Pre-ambles* 18

 6.1.2 *Even-aged Stocking Standards*..... 18

 6.1.3 *Uneven-aged Stocking Standards* 18

 6.1.4 *Mixedwood Stocking Standards*..... 18

 6.1.5 *Broadleaf Stocking Standards*..... 18

 6.1.6 *Partial Cut Stocking Standards* 18

 6.1.7 *Minimum Stocking Standards (MSSpa AND MSSp)*..... 19

 6.1.8 *Minimum Inter-tree Distance*..... 19

 6.1.9 *Crop Tree/Brush Ratio* 19

6.1.10 *Characteristics of Residual Mature and Pole Layer Crop Trees*..... 20

6.1.11 *Broadleaf Free Growing Heights*..... 20

6.1.12 *Regeneration Delay* 20

6.1.13 *Maximum Density*..... 20

6.1.14 *Free Growing Damage Criteria* 20

6.1.15 *Tree Species Mix* 21

6.1.16 *White Pine*..... 21

6.1.17 *Free Growing Standard Adjustment*..... 21

6.1.18 *Minimum Stratum Size* 21

6.1.19 *Species Suitability* 21

7.0 SIGNATURES OF PREPARING FORESTER AND PERSON REQUIRED TO PREPARE PLAN . 22

APPENDIX A – STOCKING STANDARDS TABLES..... 23

APPENDIX B - CONIFER PARTIAL CUTTING STOCKING STANDARDS..... 31

APPENDIX C - BROADLEAF STOCKING STANDARDS 37

APPENDIX D – MIXED WOOD STOCKING STANDARDS 38

APPENDIX E – FSP MAP 39

LIST OF TABLES

TABLE 1. DEVIATION FROM POTENTIAL (DFP) VOLUME BY UNDERSTORY TREE DENSITY AND OVERSTORY BASAL AREA..... 33

TABLE 2. MINIMUM PARTIAL-CUTTING STOCKING STANDARDS FOR SITE SERIES WITH 700/1200 EVEN- AGED STOCKING STANDARDS..... 35

TABLE 3. MINIMUM PARTIAL-CUTTING STOCKING STANDARDS FOR SITE SERIES WITH 500/1000 EVEN-AGED STOCKING STANDARDS..... 35

TABLE 4. TREE ACCEPTABILITY CRITERIA PARTIAL CUTTING STOCKING ASSESSMENT PROCEDURE. 35

LIST OF FIGURES

FIGURE 1. STOCKING ZONE, LOWER BASAL AREA LIMIT, MINIMUM STOCKING LINE, AND ISOLINES OF AVERAGE STAND DIAMETER FOR ASSESSING PARTIAL CUT STANDS IN AINSWORTH - LILLOOET TSA. 32

FIGURE 2. STOCKING DECISION FLOWCHART 34

1. DEFINITIONS AND INTERPRETATION

1.1 Definitions

In this FSP:

- **“Evaluation”** means an assessment conducted by a **Qualified Registered Professional** that examines, on a site specific basis, the social, economic and environmental factors as well as relevant factors as described in FPPR Schedule 1. An evaluation includes the development of alternative results or strategies that are consistent with the intent of the applicable objective.
- **“FDU”** means the area outlined as the FDU on the FSP Map (Appendix E – FSP Map).
- **“FPPR”** means the Forest Planning and Practices Regulation, consolidated to December 31, 2004 as amended from time to time;
- **“FRPA”** means the *Forest and Range Practices Act*, SBC 2002, c. 69, as amended from time to time;
- **“FSP”** means this Forest Stewardship Plan;
- **“Holder”** means the Holder of this FSP: the Wells Gray Community Forest Corporation;
- **“Kamloops LRMP”** means the Kamloops Land and Resource Management Plan approved by the government in 1995 and as amended from time to time;
- **“Qualified Registered Professional”** means;
 - (1) A person with the prescribed qualifications, and is licensed by one or more of the following;
 - (a) an agrologist under the *Agrologists Act*,
 - (b) a professional biologist under the *College of Applied Biology Act*,
 - (c) a professional engineer or professional geoscientist under the *Engineers and Geoscientists Act*, or
 - (d) a forest professional under the *Foresters Act* and being authorized under that Act to practice as a professional in relation to the subject matter prescribed under that paragraph or those paragraphs, as the case may be, and;
 - (2) has the appropriate education, experience and training to carry out the activity.
- **“Submission”** means the electronic submission of a Cutting Permit or Road Permit to the Forest Tenures Administration (FTA) system for approval.
- **“Wildlife Tree Patches”** means an area occupied by a group of trees with special characteristics that provide valuable habitat for the conservation and enhancement of wildlife.

1.2 Definitions under Enactments

Unless otherwise expressly indicated, or indicated by context, terms used in this FSP have the definition given them, as of the Submission Date, in *Forest and Range Practices Act* and associated regulations and the *Forest Act* and the regulations under them, as amended from time to time.

2. SUBMISSION DATE, TERM AND COMMENCEMENT DATE OF THIS FSP

2.1 Submission Date

The date of submission of this FSP is to be determined at final submission.

2.2 Term

The Term of this FSP is 5 years beginning on the Commencement Date.

2.3 Commencement Date

The Commencement Date for the Term of this FSP is the date specified by the minister in approving this FSP.

3. APPLICATION OF THIS FSP

3.1 FSP Holder

The holder of this FSP is the Wells Gray Community Forest Corporation.

3.2 Application of this FSP (FRPA s. 3(4))

This FSP applies to Probationary Community Forest Agreement K2A (CFA_K2A).

4. FOREST DEVELOPMENT UNITS IN EFFECT ON THE DATE OF SUBMISSION OF THIS FSP (FPPR S. 14(1)(B))

There are no Forest Development Units (FDU's) in effect on the Date of Submission of this FSP.

The FSP map (Appendix E – FSP Map) shows the area of the proposed FDU that takes effect with the approval of this FSP.

4.1 Items Identified in the FDU

Forest Stewardship Plan Map (Appendix E – FSP Map) identifies locations of the following items that were in effect on the Submission Date as per section 14(2) and (3) of the FPPR, and are within the FDU:

- Ungulate winter range areas, wildlife habitat areas¹, fisheries sensitive watersheds², lakeshore management zones³, scenic areas, L1 lakes, community watersheds, old growth management areas, and areas where commercial timber harvesting is prohibited by an enactment.

5. RESULTS OR STRATEGIES

5.1 Incorporation of LRMP Objectives into the FSP

On January 23, 2006 the Minister of Agriculture and Lands signed the Order amending the "original order" dated January 23, 1996 which declared the Kamloops Land and Resource Management Plan (KLRMP) to be a Higher Level Plan (HLP). The purpose of the amended order is to facilitate implementation of the KLRMP in the context of the *Forest and Range Practices Act* and Forest Stewardship Plan content requirement. The order clarifies which provisions regarding zones, objectives and strategies from the KLRMP constitute the HLP objective and establish the area, or (Special) Resource Management Zone, to where the objective applies. Twenty six objectives were outlined by the HLPO. All HLPO Objectives that apply to the FDUs have been addressed or considered:

5.2 Soil Management and Conservation Objective

Objective
FPPR Sec 5 - The objective set by government for soils, is without unduly reducing the supply of timber from British Columbia's forests, to conserve the productivity and the hydrologic function of soils.
Applicable Area: Within the FDU.
Result or Strategy
<u>Approach to Harvesting and Roads</u> If the Holder of this FSP carries out primary forest activities, the Holder will undertake to comply with Sections 35 and 36 of the FPPR.

¹ There are no Wildlife Habitat Areas designated within the FDU and so there are no WHAs displayed on the FSP Maps.

² No Fisheries Sensitive Watersheds (FSWs) have been identified in the FDU and so there are no FSWs displayed on the FSP Maps.

³ Lakeshore Management Zones have not been established and so the LMZs have not been displayed on the FSP maps.

5.3 Water Objectives

5.3.1 Community Watersheds

Objective
<p>FPPR Sec 8.2 - The objective set by government for water being diverted for human consumption through a licensed waterworks in a community watershed is to, without unduly reducing the supply of timber from British Columbia's forests, prevent the cumulative hydrological effects of primary forest activities within the community watershed from resulting in:</p> <ul style="list-style-type: none"> a) a material adverse impact on the quantity of water or the timing of the flow of the water from the waterworks, or b) the water from the waterworks having a material adverse impact on human health that cannot be addressed by water treatment required under (i) an enactment, or (ii) the licence pertaining to the waterworks.
<p>Applicable Area: Within Designated Community Watershed areas within the FDU.</p>
<p>Result or Strategy</p> <p><u>Definitions</u></p> <p>1.1 In Paragraph 1.2:</p> <ul style="list-style-type: none"> (a) “Designated Community Watersheds” means the Hascheak, McDougall, and Russell community watersheds. <p><u>Approach to Harvesting and Roads</u></p> <p><i>Note: Through the development of the following strategies, the Holder of this FSP requests an exemption to the cumulative effects component of Sections 59 to 61 of FPPR within community watersheds, as permitted through Section 12.32 of FPPR.</i></p> <p>1.2 If the Holder of this FSP carries out primary forest activities within Designated Community Watersheds, the Holder will:</p> <ul style="list-style-type: none"> (a) complete assessments as required in the manner recommended by a Qualified Registered Professional; (b) ensure that primary forest activities are planned and conducted in a manner that is consistent with the assessment recommendations.

5.3.2 General Water Resources

Objective
Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec 2.1.2) - Ensure implementation of a referral process to notify all potentially impacted water licensees when development is proposed.
Applicable Area: Within the FDU.
Result or Strategy
<p><u>Approach to Harvesting and Roads</u></p> <p>If the Holder of this FSP carries out primary forest activities, the Holder will contact water licensees to solicit input prior to Cutting Permit or Road Permit Submission if it is determined that the water license holder may be impacted by the primary forest activities;</p>

5.4 Riparian Management Objectives

5.4.1 Lakeshore Management

Objective
Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec 2.1.2.1) - Manage riparian areas, including streams, wetlands and lakes in accordance with the Forest Planning and Practices Regulation and the Kamloops and Clearwater District Lakeshore Management Guidelines, or other applicable management tools or agency agreements.
Applicable Area: Within the FDU.
Result or Strategy
<p><u>Definitions</u></p> <p>1.1 In Paragraph 1.2, “Lakes LRUP” means the <i>Clearwater Forest District Lakes Local Resource Use Plan – Lakeshore Management Guidelines</i> dated August 1, 2001.</p> <p><u>Approach to Harvesting and Roads</u></p> <p>1.2 If the Holder of this FSP carries out primary forest activities within the ±190 m lakeshore management zone around classified lakes, the Holder will:</p> <ul style="list-style-type: none"> (a) ensure that, exclusive of the need for referrals, consultation and the submission of variance approvals, the primary forest activities are carried out in a manner that is consistent with the intent of the harvesting guidelines found within the Lakes LRUP; (b) ensure that a rationale for forest management flexibility permitted within the Lakes LRUP will be developed and documented by a Qualified Registered Professional.

5.4.2 General Riparian Management

Objective
FPPR Sec 8 - The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas.
Applicable Area: Within the FDU.
Result or Strategy
<p><u>Approach to Harvesting and Roads</u></p> <p>If the Holder of this FSP carries out primary forest activities, the Holder will</p> <ul style="list-style-type: none"> (a) undertake to comply with Sections 47 to 51, 52(2) and 53 of the FPPR and (b) implement retention strategies in a Riparian Management Zone for streams, wetlands and lakes as outlined in Table 1, Table 2, and (c) Table 3 below;

Table 1. Riparian Retention Strategies – Streams

Streams				% Basal Area Retention – Streams General Objectives**	
Riparian Class	Width (m)	Riparian Reserve Zone (m)	Riparian Management Zone (m)	Riparian Management Zone	
				Low Windthrow Risk	Mod/High Windthrow Risk
S1	>20	50	20	≥ 25	0-50
S2	>5<20	30	20	≥ 25	0-50
S3	>1.5<5	20	20	≥ 25	0-50
S4	<1.5	0	30	≥ 25	0-50
S5	>3	0	30	0-30	0-30
S6	<3	0	20	0-20	0-20

** These are General Objectives for % Basal Area Retention. Site specific factors may require additional retention to meet the objective of ensuring the viability of the RRZ. Site specific factors include water quality and fish habitat protection, level of shading required, sediment filtering, stream bank integrity, etc.

Table 2. Riparian Retention Strategies – Wetlands

Wetlands				% Basal Area Retention – Wetlands**
Riparian Class*	Area (ha)	Riparian Reserve Zone (m)	Riparian Management Zone (m)	Riparian Management Zone
W1	≥5	10	40	0-30
W3	≥1 & <5 ***	0	30	0-30
W5	Complex Wetlands*	10	40	10-50

*Refer to definition of wetland classifications found in FPPR Section 48.

** These are General Objectives for % Basal Area Retention. Site specific factors will be considered when defining retention to meet the objective of ensuring the viability of the RRZ. Site specific factors include water quality and fish habitat protection, level of shading required, sediment filtering, stream bank integrity, etc.

*** Wetlands of this size, outside of the following ecosystems: PP, IDFxh, xw, xm, and BG.

Table 3. Riparian Retention Strategies – Lakes

Lakes			% Basal Area Retention – Lakes***
Lake Class *	Riparian Reserve Zone Width (m)	Riparian Management Zone Width (m)	Riparian Mgmt Zone
A	0	0	N/A
B	10	0	N/A
C	10	20	>=10 [†]
D	0	30	>=10
E	0	30	>=10

*Refer to definition of lakes classifications found in the **Lakes LRUP**.
 *** These are General Objectives for % Basal Area Retention. Site specific factors will be considered when defining retention to meet the objective of ensuring the viability of the RRZ. Site specific factors include water quality and fish habitat protection, level of shading required, sediment filtering, stream bank integrity, etc.
[†]The >=10% BA retention represents compliance to FPPR Sec 52 and the reference to BA retention for small tenures.

5.5 Biodiversity Objectives

5.5.1 General Biodiversity

Objective
Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec 2.1.3.1) - To conserve the diversity and abundance of native species and their habitats throughout the Kamloops LRMP
Applicable Area: Within the FDU.
Result or Strategy
<p><u>Approach to Harvesting and Roads</u></p> <p>The results or strategies in the following sections of this FSP are the results or strategies for this objective:</p> <ul style="list-style-type: none"> • Section 5.5.2 - Landscape Level Biodiversity • Section 5.5.3 – Wildlife Tree Retention • Section 5.5.2 - Old Growth Management Areas • Section 5.4 - Riparian Management • Section 5.7 - Wildlife and Species at Risk

5.5.2 Landscape Level Biodiversity

<p>Objective</p> <p>FPPR Section 9 - The objective set by government for wildlife and biodiversity at the landscape level is, without unduly reducing the supply of timber from British Columbia's forests and to the extent practicable, to design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape.</p>
<p>Applicable Area: Within the FDU.</p>
<p>Result or Strategy</p> <p><u>Approach to Harvesting and Roads</u> When the Holder of this FSP carries out primary forest activities, the Holder will undertake to comply with Sections 64 and 65 of the FPPR.</p>

<p>Objective</p> <p>Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec. 2.1.3) - Maintain old growth attributes within landscape units.</p>
<p>Applicable Area: Within the FDU.</p>
<p>Results or Strategies</p> <p><u>Approach to Harvesting and Roads</u> When the Holder of this FSP carries out primary forest activities, the Holder will ensure that the activities are designed and carried out in a manner that is consistent with the requirements of the <i>Ministry of Sustainable Resource Management Old Growth Management Area Implementation Policy and Procedures</i>, (July 18, 2004), as applied to the "Draft 4" Old Growth Management Areas (December 2004).</p>

5.5.3 Stand Level Biodiversity

Objective	
FPPR Sec 9.1 - The objective set by government for wildlife and biodiversity at the stand level is, without unduly reducing the supply of timber from British Columbia's forests, to retain wildlife trees.	
Applicable Area: Within the FDUs.	
Result or Strategy	
Approach to Harvesting and Roads	
1.1	When the Holder of this FSP carries out primary forest activities, the Holder will ensure that: <ol style="list-style-type: none"> (a) at least 80% of the cutblocks greater than 10 hectares with harvesting completed during the 12 month period beginning on April 1 of any calendar year will have one or more Wildlife Tree Retention Areas associated with the cutblock; (b) for each cutblock, the distance from a Wildlife Tree Retention Area to another Wildlife Tree Retention Area or area with attributes of a mature forest will not exceed 500 metres.
1.2	The Holder of this FSP will not carry out timber harvesting within a Wildlife Tree Retention Area unless: <ol style="list-style-type: none"> (a) the trees on the Net Area to be Reforested of the cutblock to which the Wildlife Tree Retention Area relates have developed attributes that are consistent with a mature forest or, (b) where no practicable options exist for road construction,
1.3	Wildlife Tree Retention harvested under Sec 1.2 (b) will be replaced with equivalent or other Wildlife Tree Retention.

5.6 Recreation Objectives

5.6.1 Recreation Sites and Trails

Objective	
FRPA Sec 180 - Manage known recreation sites in accordance with established objectives	
Applicable Area: Within established recreation sites and trails in the FDU.	
Result or Strategy	
1.1	When the Holder of this FSP carries out primary forest activities in areas adjacent to a recreation site or trail with established objectives, the Holder will ensure that the activity is designed and carried out in a manner that is consistent with the established objectives.

5.7 Wildlife Objectives

5.7.1 Moose

The following objectives and associated results or strategies pertain to the Moose Winter Range areas as identified in the Kamloops LRMP (1995).

Objective	
	Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec. 2.1.12.2) - Critical Moose Winter Range – Maintain thermal and visual cover for moose, and enhance browse production.
	Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec. 2.1.12.2) - Critical Moose Winter Range – Maintain suitable forest cover attributes with respect to thermal cover and forage production.
	Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec. 2.5.1) - The overall objective of special resource management zones for habitat and wildlife management areas is to: maintain or enhance identified wildlife habitat areas.
Applicable Area: Moose Winter Range within the FDU.	
Result or Strategy	
<u>Definitions</u>	
1.1	In Paragraph 1.2: <ul style="list-style-type: none"> (a) “Extended Use Roads” means newly constructed roads that are planned for more than 2 years of use for forestry activities; (b) “Moose Forage” means palatable species of plants that are a food source for Moose. These plants include Salix spp., red-osier dogwood and Betula spp.; (c) “Moose Habitat” means wetlands in Moose Winter Range that are either 200 metres in length or greater than one hectare in size and that contain habitat features required by Moose as defined by a Qualified Registered Professional; (d) “Moose Winter Range” means areas identified in Figure 4 of the Kamloops Land and Resource Management Plan, map dated March 31, 1996, as <i>Critical Moose Winter Range</i>. (e) “Moose Management Units” means 200 metre buffers around Moose Habitat; (f) “Visual Screening” means vegetation and/or topography providing visual obstruction that makes it difficult to see into adjacent areas from the roadbed.
<u>Approach to Harvesting and Roads</u>	
1.2	If the Holder of this FSP carries out primary forest activities within an area in the FDU that is in Moose Winter Range , the Holder will: <ul style="list-style-type: none"> (a) pursue mixed forest management with similar species distribution to natural stands (including deciduous) (LRMP 2.1.12.2), (b) within each Moose Management Unit, retain at least 67% of the forested area equal to or greater than 20 years of age, (c) where present, retain Visual Screening along those Extended Use Roads that are located within 100 meters of a Moose Management Unit, and (d) retain Moose Forage during silviculture activities (including brushing, weeding and stand tending) unless retaining Moose Forage impedes the ability of a stand to reach free growing status.

5.7.2 Lewis’s Woodpecker

Objective	
Kamloops LRMP HLP Order dated January 23, 2006 (LRMP 2.1.12) - Ensure habitat needs of all naturally occurring wildlife species are provided for. Special attention will be paid to those red- and blue- listed species, as defined by BC Environment, and species designated as regionally important (e.g. Mule Deer)	
Applicable Area: Within the FDU.	
Result or Strategy	
<u>Definitions</u>	
1.1	In Paragraphs 1.2 and 1.3: (a) “Lewis’s Woodpecker Known Locations” means areas where this species is found; (b) “Total Habitat Required” means 650 ha of habitat specified in the Species at Risk Background Information Document .
<u>Approach to Harvesting and Roads</u>	
1.2	Subject to Paragraph 1.3, if the Holder of this FSP carries out primary forest activities in an area occupied by Lewis’s Woodpecker the Holder will: (a) refer to the Lewis’s Woodpecker <i>Accounts and Measures for Managing Identified Wildlife</i> (Identified Wildlife Management Strategy Version 2004) and/or other pertinent information for guidance during the development of strategies to conserve sufficient habitat in that area; and (b) considers Lewis’s Woodpecker Known Locations when establishing Wildlife Tree Patches ;
<u>Amount of Area Affected</u>	
1.3	The amount of area subject to Paragraph 1.2 is the Total Habitat Required (proportional to the FDU area) consistent with the policy direction on timber supply impacts.

5.7.3 Badger

Objective	
Kamloops LRMP HLP Order dated January 23, 2006 (LRMP 2.1.12) - Ensure habitat needs of all naturally occurring wildlife species are provided for. Special attention will be paid to those red- and blue- listed species, as defined by BC Environment, and species designated as regionally important (e.g. Mule Deer)	
Applicable Area: Within the FDU.	

<p>Result or Strategy</p>	
<p><u>Definitions</u></p>	
1.1	<p>In Paragraphs 1.2 and 1.3:</p> <p>(a) “Badger Known Locations” means areas where this species is found;</p> <p>(b) “Total Habitat Required” means 35 ha of habitat specified in the Species at Risk Background Information Document.</p>
<p><u>Approach to Harvesting and Roads</u></p>	
1.2	<p>Subject to Paragraphs 1.3, the Holder of this FSP will only carry out primary forest activities in an area occupied by Badger if the Holder ensures that the design of the area:</p> <p>(a) refers to the <i>Badger Accounts and Measures for Managing Identified Wildlife</i> (Identified Wildlife Management Strategy Version 2004) and/or other pertinent information for guidance during the development of strategies to conserve sufficient habitat; and,</p> <p>(b) considers Badger Known Locations when establishing Wildlife Tree Patches.</p>
<p><u>Amount of Area Affected</u></p>	
1.3	<p>The amount of area subject to Paragraph 1.2 is the Total Habitat Required (proportional to the FDU area) consistent with the policy direction on timber supply impacts.</p>

5.8 Visual Objectives

5.8.1 Visually Sensitive Areas in the Headwaters Forest District (Kamloops TSA)

<p>Objective</p>	
<p>FPPR Sec 9.2(2) - The objective set by government in relation to visual quality for a scenic area, that</p> <p>a) was established on or before October 24, 2002, and</p> <p>b) for which there is no visual quality objective is to ensure that the altered forest landscape for the scenic area</p> <p>c) in visual sensitivity class 1 is in either the preservation or retention category,</p> <p>d) in visual sensitivity class 2 is in either the retention or partial retention category,</p> <p>e) in visual sensitivity class 3 is in either the partial retention or modification category,</p> <p>f) in visual sensitivity class 4 is in either the partial retention or modification category,</p> <p>g) in visual sensitivity class 5 is in either the modification or maximum modification category</p>	
<p>Kamloops LRMP HLP Order dated January 23, 2006 (LRMP 2.1.14.2) - The primary objective of management in Visually Sensitive Areas is to ensure that the levels of visual quality expected by society are achieved on Crown land in keeping with the concepts and principles of integrated resource management.</p>	
<p>Applicable Area: Scenic Areas within the FDU.</p>	

Result or Strategy

Definitions

1.1 In Paragraphs 1.2 and 1.3, “**Visually Sensitive Areas**” means the combined area represented in Figure 5 of the Kamloops LRMP (July 28, 1995) as well as the current visual landscape inventory. These areas are displayed on Appendix E – FSP Map;

Approach to Harvesting and Roads

1.2 Subject to Paragraph 1.3 and 1.4, the **Holder** of this **FSP** will only carry out primary forest activities in a **Visually Sensitive Area** according to the following visual landscape management targets

		Scenic Area					
		VSC = 1	VSC = 2	VSC = 3	VSC = 4	VSC = 5	NVS
VSA	In	P or R	R or PR	PR or M	PR or M	M or MM	M
	Out	P or R	R or PR	PR or M	PR or M	M	M

Effects of Other Circumstances

1.3 Paragraph 1.2 may not apply:

- (a) if and to the extent necessary for harvesting or road construction required for safety, fire suppression, salvage or to manage pest or disease outbreaks and/or
- (b) where, outside the control of the **Holder**, natural events or actions by third parties, following Cutting Permit or Road Permit **Submission**, have impacted **Visually Sensitive Areas**, so that the altered forest landscapes in Paragraph 1.2 can't be achieved.

1.4 Within stands attacked by forest health factors, all reasonable efforts will be made to be fully consistent with the VQOs outlined in Section 1.2. Where this is not practicable, the visual condition to be achieved may be greater in scale and visual acuity than that specified for the established VQO, but will be consistent with the design elements of the established VQO.

5.8.2 Areas Outside Visually Sensitive Areas within the Kamloops TSA

Objective

Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Section 2.1.14.1) - Areas outside the identified visually sensitive areas in the Kamloops LRMP are managed for landscape objectives as follows: alterations may dominate the characteristic landscape but must borrow from natural line and form to such an extent and on such a scale that they are comparable to natural occurrences.

Applicable Area: Areas outside the identified visually sensitive areas within the FDU.

Result or Strategy

Definitions

1.1 In Paragraphs 1.2 and 1.3, “**Visually Sensitive Areas**” means areas presented in Figure 5 (July 28, 1995) of the Kamloops LRMP;

Approach to Harvesting and Roads

1.2 Subject to Paragraph 1.3, within an area in the FDU that is outside of the identified Visually Sensitive Areas, the **Holder** of this **FSP** will only carry out primary forest activities if the **Holder** ensures that the design of the cutblock or road is consistent with mimicking naturally occurring landscape characteristics with variety of openings (in size, shape and distribution), by following natural boundaries, lines and forms such as ridgelines, creeks, draws, rock outcrops or timber types etc. to ensure that naturally appearing boundaries remain;

Effects of Other Circumstances

1.3 Paragraph 1.2 may not apply:

- (a) if and to the extent necessary for harvesting or road construction required for safety, fire suppression, salvage or to manage pest or disease outbreaks and/or
- (b) where, outside the control of the **Holder**, natural events or actions by third parties, following Cutting Permit or Road Permit **Submission**, have impacted **Visually Sensitive Areas**, so that the altered forest landscapes in Paragraph 1.2 can't be achieved.

5.9 Cultural Heritage Objectives

<p>Objective</p> <p>FPPR Sec 10 - The objective set by government for cultural heritage resources is to conserve, or, if necessary, protect cultural heritage resources that are</p> <ul style="list-style-type: none"> a) the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and b) not regulated under the Heritage Conservation Act
<p>Applicable Area: Within the FDU.</p>
<p>Result or Strategy</p> <p><u>Definitions</u></p> <p>1.1 In Paragraph 1.2:</p> <ul style="list-style-type: none"> (a) “Assessments” means an assessment carried out by a qualified person, appropriate to the site; may also include the development of recommended mitigation measures; (b) “Qualified Person” means a person who has appropriate education and/or experience to carry out a specified activity; <p><u>Approach to Harvesting and Roads</u></p> <p>1.2 If the Holder of this FSP conducts primary forest activities, the Holder will:</p> <ul style="list-style-type: none"> (a) for non-archaeological cultural heritage resources: <ul style="list-style-type: none"> (i) follow any development specific or general protocols developed by WGCF or the MOFR, not including BC Timber Sales, in conjunction with the aboriginal group or individual in accordance with their traditional use areas or (ii) in the absence of a general or specific protocol, strive to meet with aboriginal groups and also provide the general location of cut blocks and roads outside cutblocks in the form of reference material to the Ministry of Forests and Range and the aboriginal group at least 60 days before applying for a cutting permit or road permit for the area within the FDU, and (iii) where the need for an expedited process is deemed necessary to facilitate primary forest activities associated with forest health and/or salvage, the timeframe for submission of the reference map will be at least 10 days prior to applying for a cutting permit or road permit (b) if the Cultural Heritage Resource has not been addressed in (a), conduct an Assessment(s) using a Qualified Person prior to Cutting Permit or Road Permit Submission on areas: <ul style="list-style-type: none"> i. marked as high potential in an Archaeological Overview Assessments, or ii. brought forward by the Minister of Forests and Range or an aboriginal people group in the form of site specific information regarding cultural heritage resources of a traditional use of continuing importance to that people; (c) if carried out, refer to the Assessment and relevant information for guidance on development of management approaches to protect Cultural Heritage Resources when performing primary forest activities; (d) where an Assessment is carried out, communicate with the interested First Nation, the resulting mitigation or conservation measures implemented;

5.10 Archaeological Resources

Objective
Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Section 2.1.16) - Undertake archaeological assessments in all High and Medium Potential areas identified in the Archaeological Overview Assessment.
Applicable Area: Within the FDU.
Result or Strategy
<p><u>Definitions</u></p> <p>1.1 In Paragraph 1.2:</p> <p>(a) “Archaeological Assessments” means assessments initiated in response to proposed development projects which will disturb or alter the landscape, thereby potentially endangering archaeological sites. Assessments may include but are not limited to archaeological overview assessment, archaeological impact assessment, cultural heritage overview assessment or culturally modified tree assessment;</p> <p>(b) “AOA Guidelines” means the process identified as the “Guidelines for the Archaeological Overview Assessment (AOA) Process for Forest Development Planning in the Kamloops TSA” (1999) as amended from time to time.</p> <p><u>Approach to Harvesting and Roads</u></p> <p>1.2 If the Holder of this FSP carries out primary forest activities, the Holder will conform to the AOA Guidelines.</p>

5.11 Range

Objective
Kamloops LRMP HLP Order dated January 23, 2006 (LRMP Sec. 2.1.10) - Minimize tree/grass/cattle conflicts through integrated management practices.
Applicable Area: Within the FDU.
Strategy
<p><u>Approach to Harvesting and Roads</u></p> <p>1.1 Before the Holder of this FSP carries out primary forest activities within an FDU that contains range tenure, the Holder will:</p> <p>(a) prior to Road Permit or Cutting Permit Submission, inform the range tenure holder of activities within or adjacent to their range tenure, and</p> <p>(b) where range tenure holder indicates that conflict between timber and range management may arise develop and implement strategies, in collaboration with the range tenure holder, to minimize such conflict through integrated management practices.</p>

5.12 Range Barriers and Invasive Plant Measures

5.12.1 Natural Range Barriers

The following measures will be undertaken by the holder of this FSP in all FDU areas that contain, or are adjacent to range tenures:

Requirement	
FPPR Section 18 - Specify measures to mitigate the effect of removing or rendering ineffective natural range barriers.	
Applicable Area: Within the FDU.	
Measures	
<u>Definitions</u>	
1.1	In Paragraphs 1.2, “ Natural Range Barrier ” means a naturally occurring feature that prohibits the movement of cattle
<u>Approach to Harvesting and Roads</u>	
1.2	The Holder of this FSP , prior to Road Permit or Cutting Permit Submission , will inform the range holder of associated planned harvesting and road construction within or adjacent to their range tenure and work with the Range Tenure holder to develop and implement mitigation measures (including timing of those measures) where impacts to Natural Range Barriers are anticipated.

5.12.2 Invasive Plants

Requirement	
FPPR Section 17 - A person who prepares a forest stewardship plan must specify measures in the plan to prevent the introduction or spread of species of plants that are invasive plants under the Invasive Plants Regulation, if the introduction is likely to be a result of the person’s forest practices.	
Applicable Area: Within the FDU.	
Measures	
<u>Approach to Harvesting and Roads</u>	
If the Holder of this FSP conducts Primary Forest Activities, the Holder will work to prevent the introduction or spread of invasive plant species by;	
	(a) prior to Cutting Permit or Road Permit Submission , reference the Ministry of Forests and Range staff and/or database system and/or other sources of information on the presence of invasive plant species in the area proposed for development;
	(b) Where the risk of invasive plant introduction or spread is likely, as identified in (a), grass seed, using invasive plant free seed that meets or exceeds Canada Common #1 forage mixture, on disturbed contiguous areas of exposed mineral soil greater than 0.5 ha, that is not subject to reforestation activities and is not a part of the running surface of an active road, within 2 years or as soon as practicable.
	(c) Should it be found that new infestations have developed within the area of the Primary Forest Activities, the forest district will be notified.
	(d) An Evaluation will be carried out within 2 years of initial seeding outlined in Section 1.1 b, to determine the necessity of, and if required, conduct re-seeding.

6. STOCKING STANDARDS

All stocking requirements are applicable across the entire **FDU**.

6.1 GENERAL STANDARDS

6.1.1 Pre-amble

The standards and criteria included in this FSP support stocking areas with ecologically suitable species that address immediate and long-term forest health issues on the area to a density that (in either case) is consistent with:

- (a) maintaining or enhancing an economically valuable supply of commercial timber from British Columbia's forests;
- (b) the timber supply analysis and forest management assumptions that apply to the area covered by the plan on the **Submission Date**; and
- (c) the application to meet specific objectives (such as broadleaf species management for specific habitat objectives or landscape level representation) that are to service an objective to the benefit of the province and the stakeholder(s), in a manner that is reasonable and worthwhile, in consideration of the trade-offs against timber supply.

6.1.2 Even-aged Stocking Standards

Even-aged stocking standards, for the appropriate biogeoclimatic zone and site series, will be applied, as permitted under this FSP, where no significant residual tree retention has been identified.

6.1.3 Uneven-aged Stocking Standards

Uneven-aged stocking standards for the appropriate biogeoclimatic zone and site series will be applied as permitted under this FSP where significant residual tree retention has been identified and the tree retention is not a result of commercial thinning, removal of individual trees, or a similar type of intermediate cutting.

6.1.4 Mixedwood Stocking Standards

Mixedwood stocking standards for the appropriate biogeoclimatic zone and site series may be applied as permitted under this FSP where neither the broadleaf nor the conifer tree species comprise more than 80% of the cruise gross basal area or volume of the stand. It is estimated this standard will influence less than 5% of the free growing obligation area.

6.1.5 Broadleaf Stocking Standards

Broadleaf stocking standards for the appropriate biogeoclimatic zone and site series may be applied as permitted under this FSP where the broadleaf tree species comprise more than 80% of the cruise gross basal area or volume of the stand. It is estimated this standard will influence less than 5% of the free growing obligation area.

6.1.6 Partial Cut Stocking Standards

Partial cutting stocking standards for the appropriate biogeoclimatic zone and site series will be applied as permitted under this FSP where significant residual tree retention has been identified and is a result of commercial thinning, removal of individual trees, or a similar type of intermediate

cutting. It is estimated this standard will influence less than 2 % of the free growing obligation area.

Details of the partial cutting stocking standards methodology and process are contained in Appendix C.

6.1.7 Minimum Stocking Standards (MSSpa AND MSSp)

If the SP does not specify any acceptable species, MSSp equals MSSpa.

6.1.8 Minimum Inter-tree Distance

Unless otherwise specified by this FSP, the MITD defaults to 2.0m for all stocking standards.

Subject to an **Evaluation** and as identified in a SP, the MITD may be reduced to 1.5m to provide an opportunity to advance the level of stocking standard achievement (improve site occupancy) associated with the following:

“Non-broadcast site conditions” that are negatively impacting the achievement of the stocking standard objective:

- hygric or wetter sites
- cluster planting (e.g. wildlife habitat)
- very rocky soils
- areas with expected high cattle trampling damage to seedlings
- deer browse
- sites with a significant number of wildlife trees
- riparian areas with a high residual component
- sites that will be stumped to manage root rot
- areas with high residual regeneration that are negatively impacting the achievement of target stocking density
- areas with high unavoidable slash loading
- very harsh sites where protected microsites are critical (e.g. shade, snow creep).

“Broadcast site conditions” that are negatively impacting the achievement of the stocking standard objective:

- cluster planting (e.g. wildlife habitat) may be required to go down to 1m.)
- mechanical site preparation associated with mounding or patch scarification
- coppice-regenerating birch: two trees within each clump may be tallied as well-spaced regardless of their inter-tree distance. However, the next well-spaced tree must be at least 2m away.

6.1.9 Crop Tree/Brush Ratio

% Height above Brush	Biogeoclimatic Zone
125	ESSF, IDF, MS, PP
150	ICH

Application of the crop tree/brush ration must also take into consideration the following:

- Up to 1,000 stems/ ha of new aspen regeneration (post-harvest) will be considered non-deleterious to crop trees at the time of free-growing.
- WSSpa broadleaf species in mixedwood managed stands will not be considered competing vegetation for conifers.
- Broadleaf species in mixedwood managed stands greater than or equal to 1m from bole to bole of a conifer will not be considered competing with the conifer.

6.1.10 Characteristics of Residual Mature and Pole Layer Crop Trees

Unless otherwise specified by this FSP, the minimum characteristics of any leave trees, including, form, health and vigor are as per the guideline criteria outlined in Section 7f of *Acceptability guidelines for residual mature and pole layer crop trees* in FS 660-1 HFP 01 and the *Tree Wounding Guidebook*.

6.1.11 Broadleaf Free Growing Heights

Unless otherwise specified by this FSP, the broadleaf free growing height will be equal to the tallest conifer height for the site series/ stocking standard ID.

6.1.12 Regeneration Delay

Up to a maximum of 7 years regeneration delay is applied to all stocking standards where harvesting has resulted in an obligation to establish a free growing stand. Where harvesting has not resulted in an obligation to establish a free growing stand as a result of commercial thinning, removal of individual trees, or a similar type of intermediate cutting, a two year regeneration is applied. In practice, the most suitable earlier regeneration delay period will be applied considering applicable TSR assumptions, site conditions and operational situations.

6.1.13 Maximum Density

- Unless otherwise specified by this FSP, the maximum density for Interior Lodgepole pine leading stands is 25,000 countable stems per hectare. Lodgepole pine leading stands are stands where Lodgepole pine is greater than and equal to 80% of the inventory.
- Unless otherwise specified by this FSP, the maximum density number for all other conifer species in non-lodgepole pine leading stands and mixed Lodgepole pine stands is 10,000 countable stems per hectare. Broadleaf density will not contribute towards stand conifer density reduction thresholds.
- Unless otherwise specified by this FSP, no maximum density number is defined for broadleaf tree species. Broadleaf species rapid self-thinning characteristics lend themselves well for natural thinning.

6.1.14 Free Growing Damage Criteria

- Even aged age class 1 stands: unless otherwise specified by this FSP, at the time of the free growing survey, the following free growing damage criteria will apply: Appendix 5 of *Establishment to Free Growing Guidebook* (revised edition May 2000, Kamloops Forest Region), Appendix 5 of *Establishment to Free Growing Guidebook* (revised edition Version 2.2, May 2000, Vancouver Forest Region) and/or Appendix 5 of *Establishment to Free Growing Guidebook* (version 2.3, Cariboo Forest Region, January 2002).
- Uneven-aged stands, layer 3 & 4 advance regeneration: unless otherwise specified by this FSP, at the time of the free growing survey the following free growing damage criteria will apply: Appendix 10, Table A10-1 of the *Establishment to Free Growing Guidebook* (revised edition May 2000, Kamloops Forest Region), Appendix 10, Table A10-1 of the *Establishment to Free Growing Guidebook* (revised edition Version 2.2, May 2000, Vancouver Forest Region) and/ or Appendix 10, Table A10-1 of the *Establishment to Free Growing Guidebook* (version 2.3, Cariboo Forest Region, January 2002).
- A tree susceptible to dwarf mistletoe that is located within 10 m of an overtopping tree, which is infected with dwarf mistletoe, will not be considered susceptible if the overtopping infected tree is part of an approved cut block boundary or is reserved from harvest within the harvestable area to address other non-timber objectives, as permitted under this FSP.

6.1.15 Tree Species Mix

- To help maintain a similar tree species mix within a landscape unit, commercially valuable dominant and co-dominant conifer species having greater than 20% of the gross cruise basal area or volume will be considered a “preferred” species.
- To help maintain a similar tree species mix within a landscape unit for broadleaf and mixedwood managed stands, commercially valuable dominant and co-dominant broadleaf species having at least 10% of the gross cruise basal area or volume will be considered a “preferred” species and an “acceptable” species if the gross cruise basal area or volume is less than 10%.

6.1.16 White Pine

- Where Pw is listed as an acceptable species, planted rust resistant stock will be considered preferred to a maximum of 50% of the total preferred and acceptable well spaced stems.
- To reduce white pine blister rust infections, non-rust resistant Pw is to be pruned to 1.3 meter height where it makes up more than 5% of the minimum free growing number. SU with less than 5% non-resistant Pw contributing to the minimum free growing number require no pruning and can be accepted as free growing.

6.1.17 Free Growing Standard Adjustment

Based on an **Evaluation** at the time of the development of the SP or within two years after the completion of harvest, the stocking standard target and minimum WSS values and minimum height criteria may be reduced. The reduction is to address the resulting impacts of established non-timber objectives that restrict the ability to achieve the WSS and height values for the stocking standard. This adjustment is to be applied where the stocking standard is not correct for the planned or resulting stand structure or site condition due to:

- modifying a silviculture system to address visuals, wildlife, adjacency, cattle, grassland, First Nations cultural heritage, beetle management areas with lower levels of beetle attack, and/or susceptible host trees;
- dispersed non-plantable ground having site conditions and limiting factors associated with soil moisture, soil temperature, soil nutrients, climatic conditions, tree species and stock type to be planted, site occupancy target, and growing space.

It is estimated the standard adjustment will influence less than 2 % of the silviculture obligation area. Refer to Section 7.2 of the “Background Document for Government” for methodology and assessment procedure.

6.1.18 Minimum Stratum Size

- The reforestation establishment component of a free growing stocking standard applies to continuous NSR openings > 1.0 ha.
- At the time of free growing, the free growing stocking standards apply to continuous openings > 2.0 ha (except for NSR, which remains at > 1.0 ha).

6.1.19 Species Suitability

Unless specified otherwise in this FSP, the species suitability identified in the even-aged stocking standards applies to the other stocking standards within this FSP.

7.0 SIGNATURES OF PREPARING FORESTER AND PERSON REQUIRED TO PREPARE PLAN

	<p>Preparing Forester</p> <p><i>"I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work."</i></p>
<p>Randy Spyksma, R.P.F Planning Forester Forsite Consultants Ltd. for the Wells Gray Community Forest Corporation</p>	

	<p>Signature of Person Required to Prepare the Plan</p>
<p>Leverne Burnell President Wells Gray Community Forest Corporation</p>	

APPENDIX A – STOCKING STANDARDS TABLES

Table 4 outlines the biogeoclimatic ecosystem classification (BEC) variants and corresponding SS that will be used for the variants found in and around the WGCF. Decisions on the Stocking Standards were based in part on discussions with Dennis Lloyd, Ministry of Forests Regional Research Ecologist.

Table 4. Summary of the BEC based Stocking Standards being applied to the Wells Gray Community Forests

BEC Variant	Corresponding Stocking Standard
ICH dw 3	ICH dw 2
ICH mk 2	ICH mk 2
ICH mw 3	ICH mw 3
IDF mw 2	IDF mw 2
IDF mw 2b	IDF mw 2
MS dm 3	MS dm 2
ESSFdc 3	ESSFdc 2
ESSFdcw	ESSFdc 2 or ESSF v v
ESSFwc 2	ESSFwc 2
ESSFwcw	ESSF v v

BGC		
Classification		
Zone/SZ	Series	Standards ID
ICHmk2	01	
	02	
	03	
	04	
	05	
	06	

Regeneration Guide							Free Growing Guide			
Species		Stocking(i)			Regen Delay (Max yrs)	Assessment		Min. Height(ii)		
Conifer		Target	MIN pa	MIN p		Earliest (yrs)	Latest (yrs)	Species	Ht (m)	
Preferred (p)		Acceptable (a)								
		(well-spaced/ha)								
Fd ^{9,14,32} PI Sx	BI ^{10,13} Cw	1200	700	600	7	1	20	PI, Lw Fd Sx Others	2.0 1.4 0.8 1.0	
Fd PI	Sx ^{10,13}	600	400	400	7	1	20	PI Fd Others	1.4 1.0 0.8	
Fd PI Sx ^{10,13}	Cw ^{10,13}	1000	500	400	7	1	20	PI Fd Others	1.4 1.0 0.8	
Fd PI Sx	BI ^{10,13} Cw ^{10,13}	1200	700	600	7	1	20	PI, Lw Fd Sx Others	2.0 1.4 0.8 1.0	
Fd ^{9,14,32} PI Sx	BI ¹³ Cw ³²	1200	700	600	7	1	20	PI Fd Others	2.0 1.4 1.0	
PI ¹ Sx ¹ Fd ^{1,32}	BI ¹ Cw ³²	1000	500	400	7	1	20	PI Fd Others	1.4 1.0 0.8	

BGC			Regeneration Guide							Free Growing Guide			
Classification			Species		Stocking(i)			Regen Delay (Max yrs)	Assessment		Min. Height(ii)		
Zone/SZ	Series	Standards ID	Conifer	Acceptable (a)	Target	MIN pa	MIN p		Earliest	Latest	Species	Ht	
			Preferred (p)		(well-spaced/ha)			(yrs)	(yrs)		(m)		
ICHmw3 and ICHdw3	01		Fd Sx ^{10,13} Cw ^{10,13}	Pl ⁵¹ Bl ^{10,13} Pw ³¹	1200	700	600	7	1	20	Pl, Pw	2.0	
		01-YC	Fd Cw ^{10,13} Sx ^{10,13}	Bl ^{10,13} Hw ^{10,13} Pl ⁵¹ Pw ³¹	1200	700	600	7	1	20	Lw Fd Others	2.0 1.4 1.0	
		02	Fd Pl	Cw ^{10,13} Pw ³¹	1000	500	400	7	1	20	Pl, Pw Fd Others	1.4 1.0 0.8	
		03	Fd ³² Pl	Cw ^{10,13} Pw ³¹ Sx ^{10,13} Bl ^{10,13}	1000	500	400	7	1	20	Pl, Pw Lw Fd Others	1.4 1.4 1.0 0.8	
		04	Fd Pl ⁵¹	Cw ^{10,13} Pw ³¹ Sx ^{10,13}	1200	700	600	7	1	20	Pl, Pw Lw Fd Others	2.0 2.0 1.4 1.0	
		05	Fd Cw ^{10,13} Sx ^{10,13}	Bl ^{10,13} Pl ⁵¹ Pw ³¹	1200	700	600	7	1	20	Pl, Pw Lw Fd Others	2.0 2.0 1.4 1.0	
		06	Cw Fd ¹⁴ Hw Sx	Bl ^{10,13} Pl ⁵¹ Pw ³¹	1200	700	600	7	1	20	Pl, Pw Lw Fd Others	2.0 2.0 1.4 1.0	
		07	Cw ³² Sx Fd ^{1,32}	Bl Hw ³² Pl ⁵¹ Pw ³¹	1200	700	600	7	1	20	Pl, Pw Lw Fd Others	2.0 2.0 1.4 1.0	
		08	Cw ^{1,32} Hw ^{1,32} Pl ^{1,51} Sx ¹	Bl ¹ Pw ³¹	1000	500	400	7	1	20	Pl Others	1.4 0.8	
		09		non-forested	-	-	-	-	-	-	-	-	-

BGC		
Classification		
Zone/SZ	Series	Standards ID
IDFmw2 and IDFmw2b	01	
	01-YC	
	01-YS	
	02	
	03	
	04	
	05*	

Regeneration Guide								Free Growing Guide			
Species		Stocking(i)			Regen Delay (Max yrs)	Assessment		Min. Height(ii)			
Conifer		Target	MIN pa	MIN p		Earliest	Latest	Species	Ht		
Preferred (p)		Acceptable (a)			(well-spaced/ha)	(yrs)	(yrs)	(m)			
Fd PI	Cw ^{10,13} Sx ^{10,13} BI ^{10,13}	1200	700	600	7	1	20	PI, Lw	1.6		
								Fd	1.0		
								Others	0.8		
Fd PI	BI ^{10,13} Cw ^{10,13} Sx ^{10,13}	1200	700	600	7	1	20	PI, Lw	1.6		
								Fd	1.0		
								Others	0.8		
Fd PI	Sx ^{10,13} BI ^{10,13} Cw ^{10,13}	1200	700	600	7	1	20	PI, Lw	1.6		
								Fd	1.0		
								Others	0.8		
Fd ²⁷ PI	Py ^{9,14,16,23}	600	400	400	7	1	20	PI	1.2		
								Fd	0.8		
								Py	0.6		
Fd ¹⁴ PI	Py ^{9,14,16} Cw ^{10,13} Sx ^{10,13}	1000	500	400	7	1	20	PI, Lw	1.6		
								Fd	1.0		
								Others	0.8		
Fd ³² Sx PI	Cw ^{32,37}	1200	700	600	7	1	20	PI, Lw	1.6		
								Fd	1.0		
								Others	0.8		
Sx ¹ PI ¹	Cw ^{1,32}	400	200	200	7	1	20	PI	1.2		
								Others	0.6		

BGC		
Classification		
Zone/SZ	Series	Standards ID
ESSFdc3 (from ESSFdc2)	01	
	02*	
	03	
	04	
	05	
	06	
	07	
	08	
	09	

Regeneration Guide							Free Growing Guide			
Species		Stocking(i)			Regen Delay (Max yrs)	Assessment		Min. Height(ii)		
Conifer		Target	MIN pa	MIN p		Earliest	Latest	Species	Ht	
Preferred (p)		(well-spaced/ha)				(yrs)	(yrs)		(m)	
Acceptable (a)										
PI Se	BI	1200	700	600	7	1	20	PI	1.6	
								Others	0.8	
PI ⁵²	BI ¹³ Se	-	-	-	-	-	-	-	-	
PI	BI ¹³ Pa ^{9,17} Se	1000	500	400	7	1	20	PI	1.2	
								Others	0.6	
PI	BI ¹³ Se	1000	500	400	7	1	20	PI	1.2	
								Others	0.6	
PI Se	BI ^{10,13}	1000	500	400	7	1	20	PI	1.2	
								Others	0.6	
PI Se	BI	1200	700	600	7	1	20	PI	1.6	
								Others	0.8	
PI Se ³²	BI	1200	700	600	7	1	20	PI	1.6	
								Others	0.8	
PI ¹ Se ^{1,32}	BI ^{1,32}	1000	500	400	7	1	20	PI	1.2	
								Others	0.6	
non-forested		-	-	-	-	-	-	-	-	

BGC			Regeneration Guide					Free Growing Guide				
Classification			Species		Stocking(i)		Regen Delay (Max yrs)	Assessment		Min. Height(ii)		
Zone/SZ	Series	Standards ID	Conifer	Decid	Target	MIN pa		MIN p	Earliest	Latest	Species	Ht
			Preferred (p)	Acceptable (a)	(well-spaced/ha)			(yrs)	(yrs)		(m)	
ESSFwcw and ESSFdcw (from ESSFv v)	01		Bl ³² Se ³²	Hm ¹⁶	1200	700	600	7	1	20	All	0.8
	02		Bl ³² Se ³²	Hm ¹⁶ Pl ³⁴	600	400	400	7	1	20	PI	1.2
	03		Bl ³² Se ³²	Hm ¹⁶	1000	500	400	7	1	20	Others	0.6
	04		Bl ³² Se ³²	Hm ¹⁶	600	400	400	7	1	20	All	0.6
	05		non-forested		-	-	-	-	-	-	-	-
ESSFwc2	01		Bl Se	Pl ^{23,34}	1200	700	600	7	1	20	PI	1.60
	02*		Pl Se ^{10,13}	Bl ^{10,13}	1000	500	400	7	1	20	Others	0.80
	03		Se Bl ^{10,13}	Pl ^{23,34}	1000	500	400	7	1	20	PI	1.20
	04		Bl Se	Pl ^{23,34}	1200	700	600	7	1	20	Others	0.60
	05		Bl Se	Pl ³⁴	1200	700	600	7	1	20	PI	1.60
	06		Bl ³² Se ³²	Pl ^{23,34}	1200	700	600	7	1	20	Others	0.80
	07		Bl Se	Pl ^{23,34}	1200	700	600	7	1	20	PI	1.60
	08		Bl ^{1,32} Se ^{1,32}	Pl ^{23,34}	1000	500	400	7	1	20	Others	0.80
	09*		Pl ¹ Se ^{1,32}	Bl ^{1,32}	400	200	200	7	1	20	PI	1.20
	10		non-forested		-	-	-	-	-	-	Others	0.60

BGC		
Classification		
Zone/SZ	Series	Standards ID
MSdm3 (from MSdm2)	01	
	02*	
	03	
	04	
	05	
	06	
	07	

Regeneration Guide							Free Growing Guide			
Species		Stocking(i)			Regen Delay (Max yrs)	Assessment		Min. Height(ii)		
Conifer		Target	MIN pa	MIN p		Earliest	Latest	Species	Ht	
Preferred (p)		(well-spaced/ha)				(yrs)	(yrs)		(m)	
Acceptable (a)										
PI Sx Fd ^{9,14,32}	BI ^{10,13}	1200	700	600	7	1	20	PI, Lw Others	1.4 0.8	
non-forested Fd ^{9,14} PI	BI ^{10,13} Sx ^{10,13}	-	-	-	-	-	-	-	-	
PI Fd ^{9,14,32} Sx ^{10,13}	BI ^{10,13}	1000	500	400	7	1	20	PI Others	1.0 0.6	
PI Sx Fd ^{9,14,32}	BI Cw ³²	1200	700	600	7	1	20	PI, Lw Others	1.4 0.8	
PI Sx Fd ^{9,14,32}	BI	1200	700	600	7	1	20	PI, Lw Others	1.4 0.8	
PI Sx	BI	1000	500	400	7	1	20	PI Others	1.0 0.6	

	<u>Footnote #</u>	<u>Footnote</u>	<u>Footnote #</u>	<u>Footnote</u>
Conifer Tree Species				
"Ba" means amabilis fir;	1	elevated microsites are preferred	46	restricted to area north of the Dean Channel
"Bg" means grand fir;	2	suitable on thick forest floors	47	risk of balsam wooly adelgid
"Bl" means subalpine fir;	3	restricted to coarse-textured soils	48	risk of heavy browsing by deer
"Bp" means noble fir;	4	restricted to medium-textured soils	49	applies only to rust resistant, planted stock.
"Cw" means western red cedar;	5	footnote retired	50	restricted to sites where the species occurs as a major species in a pre-harvest, natural stand
"Fd" means Douglas-fir;	6	restricted to nutrient-very-poor sites		restricted to areas with proven PI performance
"Hm" means mountain hemlock;	7	restricted to nutrient-medium sites	51	restricted to sheltered microsites with deep soil
"Hw" means western hemlock;	8	restricted to steep slopes	52	minor component
"Lt" means tamarack;	9	restricted to southerly aspects	53	risk of unsuccessful release of advance regeneration
"Lw" means western larch;	10	restricted to northerly aspects	54	acceptable in sx-sm portion of site series
"Pa" means whitebark pine;	11	restricted to crest slope positions	55	
"Pi" means lodgepole pine;	12	suitable on cold air drainage sites		
"Pw" means white pine;	13	restricted to upper elevations of biogeoclimatic unit	#	<u>Broadleaf Management Constraints</u>
"Py" means ponderosa pine;	14	restricted to lower elevations of biogeoclimatic unit	a	productive, reliable, and feasible regeneration option
"Sb" means black spruce;	15	restricted to northern portion of biogeoclimatic unit in region	b	limited in productivity, reliability and/or feasibility
"Se" means Engelmann spruce;	16	restricted to southern portion of biogeoclimatic unit in region		
"Ss" means Sitka spruce;	17	restricted to western portion of biogeoclimatic unit in region	#	<u>Localized Footnotes</u>
"Sw" means white spruce;	18	restricted to eastern portion of biogeoclimatic unit in region		
"Sx" means hybrid spruce or interior spruce;	19	restricted, not in Queen Charlotte Islands		
"Sxs" means hybrid Sitka spruce;	20	restricted, not near outer coast	56	Kalum forest district - spruce content restricted to < 20% well-spaced and free growing trees on a standards unit due to leader weevil.
"Sxw" means hybrid white spruce;	21	restricted to mainland	57	Arrow forest district - Pw rust-resistant stock may be preferred to a max 50% of preferred and acceptable well-spaced stems.
"Yc" means yellow cedar.	22	restricted to southern Gardner Canal-Kitlope area	58	Arrow forest district - Fd limited to a max 50% of preferred and acceptable well-spaced stems due to root rot.
	23	restricted to trial use	59	Prince George region - max 1,400 total sph of aspen and cottonwood. Treat as 'ghost' trees in surveys.
Broadleaf Tree Species	24	suitable (as a major species) in wetter portion of biogeoclimatic unit	60	Squamish forest district - species is acceptable in Squamish forest district only.
"Acb" means balsam poplar;	25	suitable on sites lacking salal	61	Squamish forest district only - acceptable on cold air drainage sites only.
"Act" means black cottonwood;	26	suitable minor species on salal-dominated sites	62	S. Island forest district - may only be used as acceptable species within the balsam woolly adelgid quarantine zone.
"At" means trembling aspen;	27	partial canopy cover required for successful establishment	63	Queen Charlotte Islands forest district - must meet district manager specified minimum well-spaced preferred stems per hectare and minimum height requirements for Cw and/or Yc
"Dr" means red alder;	28	limited by moisture deficit	66	Mackenzie forest district - may be preferred where risk of snow damage is low or where risk of frost damage is excessive on spruce
"Ep" means common paper birch;	29	risk of heavy browsing by moose	67	Chilliwack forest district - species is acceptable in Chilliwack forest district only.
"Mb" means bigleaf maple;	30	risk of porcupine damage	68	Chilliwack forest district - species is preferred in Chilliwack forest district only.
"Qg" means garry oak;	31	risk of white pine blister rust	69	Species is restricted to upper elevations when used in the southern portion of the biogeoclimatic unit.
"Ra" means arbutus;	32	limited by growing-season frosts	70	Pr Rupert region - Hw is restricted to a maximum of 50% of the well spaced stems at free growing
	33	footnote retired and replaced with footnote 'a'		
"Biogeoclimatic unit" or "BGC classification" means the zone, subzone, variant and site series described in the most recent field guide published by the Ministry of Forests for the identification and interpretation of ecosystems, as applicable to a harvested area.	34	risk of snow damage		
	35	risk of weevil damage		
	36	suitable major species on salal-dominated sites		
	37	risk of heart rots		
	38	footnote retired		
	39	avoid exposed and windy sites		
"MIN or "Min" means minimum.	40	risk of redheart		
	41	limited by poorly drained soils		
	42	restricted to fresh soil moisture regimes		
	43	suitable on mainland coast only (QCI only)		
	44	suitable in areas with stronger maritime influence		
	45	suitable in areas with stronger continental influence		

APPENDIX B - CONIFER PARTIAL CUTTING STOCKING STANDARDS

Preamble

The MOFR recognized “Deviation from Potential” (DFP) stocking assessment method and standards is designed to assess regeneration stocking in partially cut stands in the BC interior. This method is especially relevant to stands with substantial variation in the size and spatial arrangement of live trees retained at harvest. Problems arise when British Columbia’s existing systems for assessing stocking are applied to highly vary structured stands.

Generally, varied structured stands materialize from managing short term non-timber objectives. The intent is to apply the DFP stocking standard to a timber harvested area where significant residual tree retention has been identified and is a result of commercial thinning, removal of individual trees, or a similar type of intermediate cutting.

Specifically, the DFP will be applied to partial cut standard units (SU) with a minimum of 5m²/ha of residual basal area (Figure 1), managed under an even-aged silviculture system. The stocking evaluation will be based on the work completed by Bancroft et. al. (2003) and Martin (2004).

The DFP method could result in some residual structures having an acceptable stocking value that is below the stocking level necessary for optimal timber production. In these situations, to meet the TSR timber production expectation, it is assumed in most cases, the harvest is an intermediate cut. Subsequent harvesting and follow-up reforestation will occur in 20 – 30 years. Retaining these structures for longer periods will result in volume losses (Przeczek 2002).

Application Rules

Figure 1 should be consulted when assessing the suitability of a stand for the DFP approach. Figure 1 uses density (sph), basal area (m²/ha), and isolines of average stand diameter (after Gingrich 1967) as the basis for displaying:

Minimum Stocking Line

- Two minimum stocking lines are presented; one for sites with 700/1200 even-aged stocking standards and one for sites with 500/1000 even-aged stocking standards.

The minimum stocking line represents the lowest residual stocking level of acceptable layer 1 stems (≥ 12.5 cm dbh) required to be considered stocked. If average stocking in a SU meets or exceeds the minimum stocking line, the SU will be considered SR or FG (if all other species selection, health, size, and damage criteria are met). In addition, $\geq 60\%$ of the area as determined by the % of plots within a SU must be acceptability stocked (Table1) .

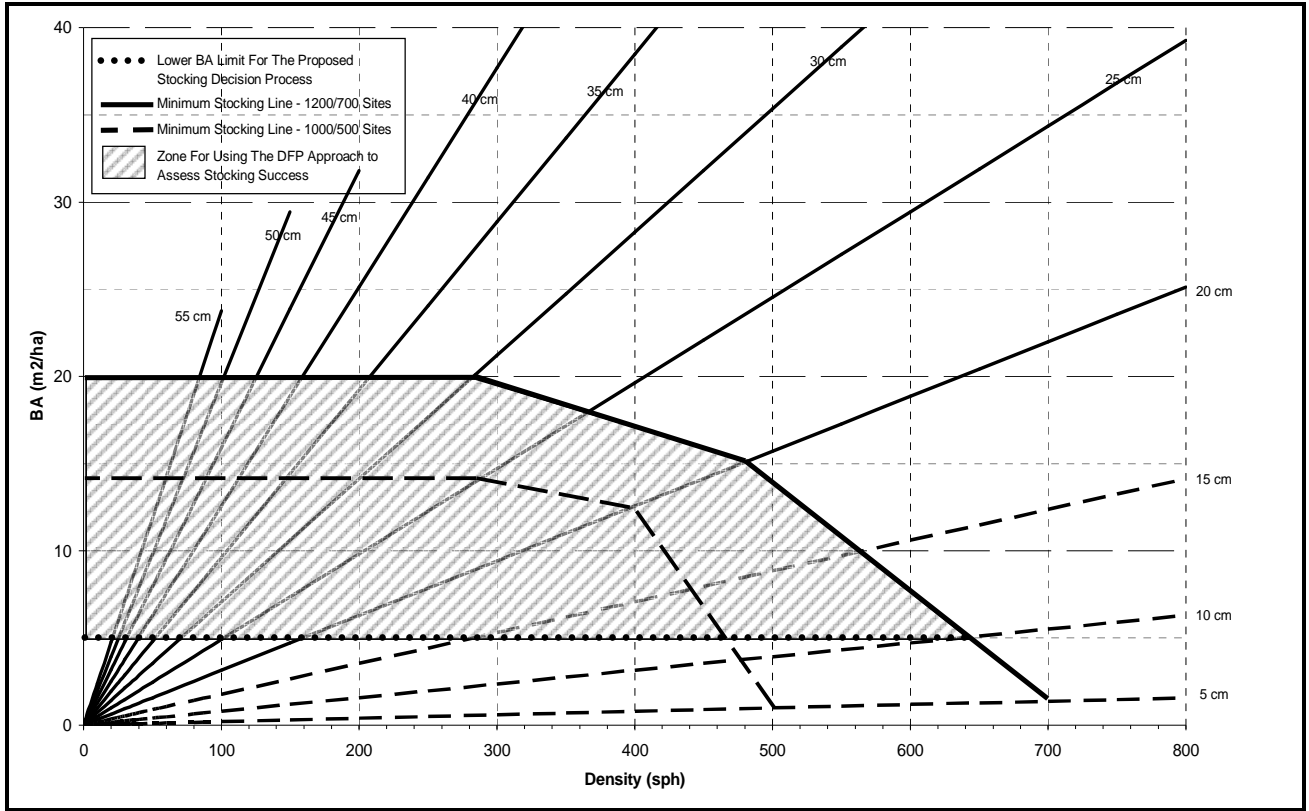


Figure 1. Stocking zone, lower basal area limit, minimum stocking line, and isolines of average stand diameter for assessing partial cut stands in Ainsworth - Lillooet TSA.

Lower Basal Area Limit

- The lower basal area line defines the lowest average residual basal area, including all layer 1 stems, ($\geq 5 \text{ m}^2/\text{ha}$) that a standards unit is allowed for the application of DFP stocking assessment. SU with residual basal areas $< 5 \text{ m}^2/\text{ha}$ should be assessed with current even-aged stocking standards.

Stocking Zone

- The stocking zone area represents the range of residual stand structures suited to the DFP approach.

Assessment Procedures

Plot assessments will be conducted as per standard even-aged regeneration and free growing assessments with the following modification:

Layer 1 stems ($\geq 12.5 \text{ cm dbh}$)

Initial indications suggest using a 3 - 5 BAF prism to collect Layer 1 stem information. All Layer 1 stems (except for dead and moribund stems) are used to calculate the DFP value for each plot. Tally the dead and moribund trees as separate classes. Because the minimum stocking line decision is based on acceptable Layer 1 stems, tally acceptable and unacceptable Layer 1 stems separately. The DFP stocking decision requires $\geq 80\%$ of the Layer 1 stems to be of acceptable quality.

Data Compilation

In addition to standard regeneration survey summary information, the following are required:

- Determine the minimum stocking line value: Compute basal area, density, and mean diameter of live acceptable L1 trees.
- Determine the Plot DFP value: Calculate the basal area (m2) and well-spaced sph for each plot and apply to Table 1.
- Determine the SU DFP value: Calculated the mean DFP value for each stratum along with the proportion (%) of stocked, partially stocked and “open” plots¹.
- A stand table (m2/ha) could be prepared for each stratum to assist with the decision making, but it is not a survey requirement.

Table 1. Deviation from potential (DFP) volume by understory tree density and overstory basal area.

OS Basal Area (m2/ha)	Well-spaced trees in plot								
	0	1	2	3	4	5	6	7	8
0	1.00	0.76	0.52	0.34	0.22	0.13	0.07	0.03	0.00
1	0.98	0.74	0.51	0.34	0.21	0.13	0.07	0.03	0.00
2	0.96	0.73	0.50	0.33	0.21	0.13	0.07	0.03	0.00
3	0.93	0.71	0.49	0.32	0.20	0.12	0.07	0.03	0.00
4	0.90	0.68	0.47	0.31	0.20	0.12	0.06	0.03	0.00
5	0.86	0.65	0.45	0.30	0.19	0.11	0.06	0.02	0.00
6	0.82	0.62	0.43	0.28	0.18	0.11	0.06	0.02	0.00
7	0.77	0.58	0.40	0.27	0.17	0.10	0.05	0.02	0.00
8	0.72	0.55	0.38	0.25	0.16	0.09	0.05	0.02	0.00
9	0.67	0.51	0.35	0.23	0.15	0.09	0.05	0.02	0.00
10	0.62	0.47	0.32	0.21	0.14	0.08	0.04	0.02	0.00
11	0.57	0.43	0.30	0.20	0.12	0.07	0.04	0.02	0.00
12	0.52	0.39	0.27	0.18	0.11	0.07	0.04	0.01	0.00
13	0.47	0.35	0.24	0.16	0.10	0.06	0.03	0.01	0.00
14	0.42	0.32	0.22	0.15	0.09	0.05	0.03	0.01	0.00
15	0.38	0.28	0.20	0.13	0.08	0.05	0.03	0.01	0.00
16	0.33	0.25	0.17	0.11	0.07	0.04	0.02	0.01	0.00
17	0.29	0.22	0.15	0.10	0.06	0.04	0.02	0.01	0.00
18	0.26	0.19	0.13	0.09	0.06	0.03	0.02	0.01	0.00
19	0.22	0.17	0.12	0.08	0.05	0.03	0.02	0.01	0.00
20	0.19	0.14	0.10	0.07	0.04	0.02	0.01	0.01	0.00
21	0.16	0.12	0.08	0.06	0.04	0.02	0.01	0.00	0.00
22	0.13	0.10	0.07	0.05	0.03	0.02	0.01	0.00	0.00
23	0.11	0.08	0.06	0.04	0.02	0.01	0.01	0.00	0.00
24	0.09	0.07	0.05	0.03	0.02	0.01	0.01	0.00	0.00
25	0.07	0.05	0.04	0.02	0.02	0.01	0.00	0.00	0.00
26	0.05	0.04	0.03	0.02	0.01	0.01	0.00	0.00	0.00
27	0.04	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00
28	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00
29	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Colour Stocking Class Growth Potential Opportunity

Open
High potential for additional volume growth
≥ 41% Additional stocking is required where timber production is the primary management objective

Partially Stocked
Moderate potential for additional volume production through additional stocking
21 – 40% Assess options, additional stocking may be required

Stocked
Low potential for additional growth through additional stocking
≤ 20% No further treatments required

¹ The % of plots calculation is a surrogate for the % of area. If the proportion or distribution of plots does not reflect the area for each DFP stocking class the calculation will be incorrect and another approach to estimating proportional area will have to be documented and applied.

Stocking Decision Matrix

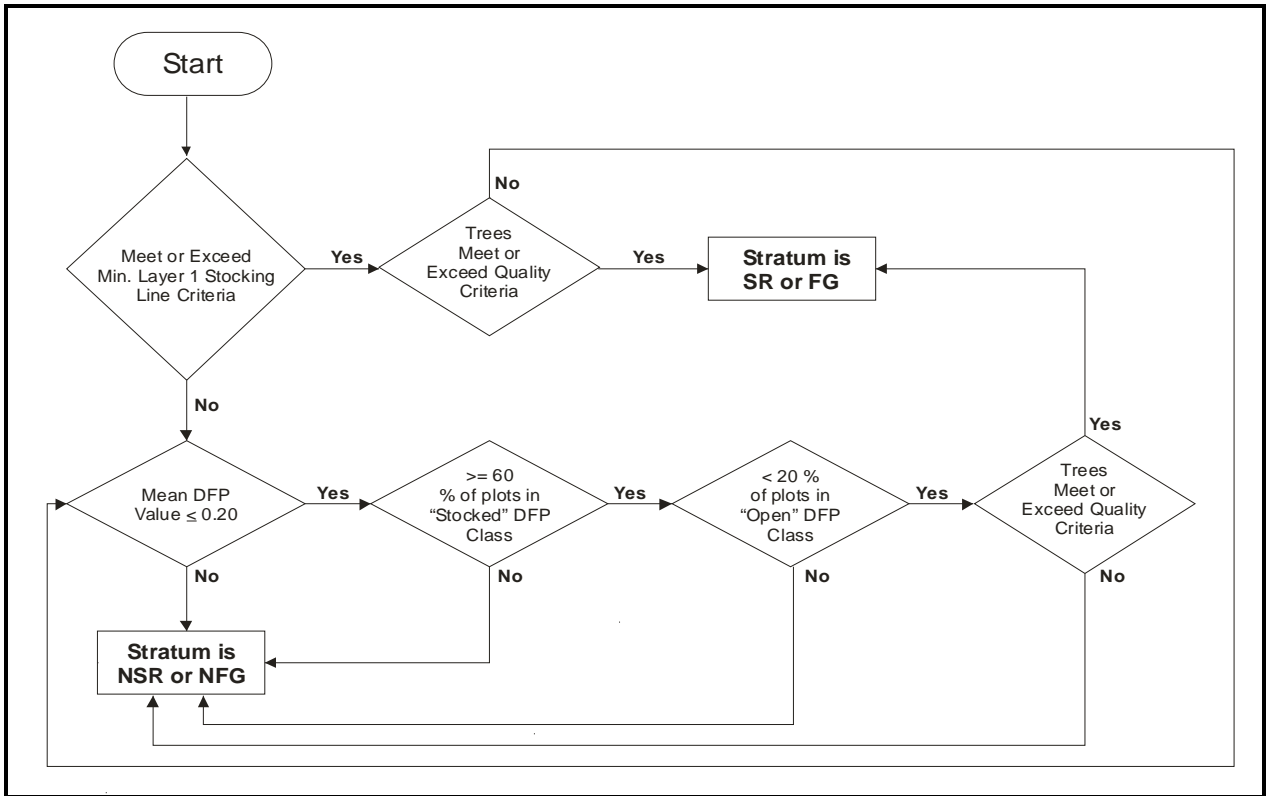


Figure 2. Stocking Decision Flowchart

Partial Cutting Stocking Standards

Minimum Stocking Line, DFP, and General Criteria

The DFP standards are listed in Tables 2 and 3. These partial cutting standards do not apply to areas prescribed for single-tree silviculture system, NDT4 ecosystem restoration (open forest or open range), beetle proofing in lodgepole pine dominated stands, or where management objectives require long term overstory retention and a reduction in yield is acceptable.

Also, many of these harvested stands will have clumped irregular stocking patterns and considerable overstory, restricting the potential for augmenting stocking through planting. The resulting biological and financial constraints will result in some stands not meeting the stocking criteria. Strata with NSR openings ≥ 1.0 ha, that are not under significant overstory influence, will be reforested. The remaining other strata cannot be declared stocked or free-growing, and may require additional harvesting treatments before stocking levels in layer 4 can be augmented.

The DFP stocking standards are considered as a first approximation. Revisions to these standards can be expected as more experience is gained from using the system and as better information becomes available.

Table 2. Minimum partial-cutting stocking standards for site series with 700/1200 even-aged stocking standards.

Notes:

Minimum Stocking Line Criteria			Deviation from Potential (DFP) Criteria			General Criteria			
Average DBH (cm) ¹	MSS Density (sph)	MSS Basal Area (m ² /ha)	Maximum Mean DFP	Maximum % Partially Stocked Plots	Maximum % Open Plots	Min. Intertree Distance ²	Regen. Delay (max. yrs.) ³	FG Earliest (yrs.) ³	FG Latest (yrs.) ³
< 12.5			0.20	40	20	n/a + 2.0	1	1	2
15	560	10							
20	480	15							
25	360	17							
30	280	20							
35	210	20							
40	180	20							
45	150	20							
50 - 60	100	20							

1. Calculation is based on stems \geq 12.5 cm dbhob; Average DBH is the weighted average for all acceptable stems.
2. No minimum intertree will be applied to layer 1 stems; a 2.0 minimum intertree distance will apply to layer 2, 3, and 4 stems.
3. Timeframes only apply where a stratum is declared SR or FG using the minimum stocking line and were chosen to allow up to 2 years for assessing windthrow damage prior to a free-growing declaration. If the minimum stocking line is not used, time frames will default to even-aged regeneration delay and free-growing delay periods.

Table 3. Minimum partial-cutting stocking standards for site series with 500/1000 even-aged stocking standards.

Minimum Stocking Line Criteria			Deviation from Potential (DFP) Criteria			General Criteria			
Average DBH (cm) ¹	MSS Density (sph)	MSS Basal Area (m ² /ha)	Maximum Mean DFP	Maximum % Partially Stocked Plots	Maximum % Open Plots	Min. Intertree Distance ²	Regen. Delay (max. yrs.) ³	FG Earliest (yrs.) ³	FG Latest (yrs.) ³
< 12.5			0.20	40	20	n/a + 2.0	1	1	2
15	440	8							
20	400	12.5							
25	290	14							
30	200	14							
35	150	14							
40	110	14							
45+	90	14							

Notes:

1. Calculation is based on stems \geq 12.5 cm dbhob; Average DBH is the weighted average for all acceptable stems.
2. No minimum intertree will be applied to layer 1 stems; a 2.0 minimum intertree distance will apply to layer 2, 3, and 4 stems.
3. Timeframes only apply where a stratum is declared SR or FG using the minimum stocking line and were chosen to allow up to 2 years for assessing windthrow damage prior to a free-growing declaration. If the minimum stocking line is not used, time frames will default to even-aged regeneration delay and free-growing delay periods.

Tree Acceptability Criteria

Table 4 provides a summary of the standards for tree acceptability for regeneration and free-growing assessments.

Table 4. Tree acceptability criteria partial cutting stocking assessment procedure.

Tree Acceptability Criteria	Regeneration Assessment	Free-growing Assessment
Species	All layer 1 stems will be considered as preferred species. Preferred and acceptable species for the site as per current even-aged stocking standards for other layers.	All layer 1 stems will be considered as preferred species. Preferred and acceptable species for the site as per current even-aged stocking standards for other layers.
MSS _p	Preferred species \geq 50% of the well-spaced stocking	Preferred species \geq 50% of the free-growing stocking
Health	Healthy	As per the Section 7f "Acceptability guidelines for residual mature and pole layer crop trees" from FS 660-1 HFP 01 and the Tree Wounding Guidebook. In stands that do not meet or exceed the minimum stocking line, \geq 80% of the total Layer 1 stems must be of acceptable quality.
Brush		Appropriate conifer/brush ratio
Height	Min. 30 cm	70% of the minimum free-growing height for the species and site
Advanced Regeneration		As per the Section 7f "Acceptability guidelines for residual pole layer crop trees" from FS 660-1 HFP 01 and the Tree Wounding Guidebook. For the layer 3 and layer 4 crop trees, default to the appropriate FSP free growing damage criteria for uneven-aged stands
Minimum Intertree Distance	2.0 m, no MITD for layer 1 stems	2.0 m, no MITD for layer 1 stems

Stocking Standards References

- Bancroft, Bryce, Ken Day, Pat Martin, Kim Peel and Ken Zielke. 2003. Partially Cut: Occupied or Not? What are my options? – A proposed survey approach. . Unpubl. FIA Rep. for Lignum Limited.
- B.C. Ministry of Forests. 2000. Establishment to free growing guidebook. Nelson Forest Region. Rev. ed., Version 2.2. For. Prac. Br., B.C. Min. For., Victoria, B.C. Forest Practices Code of British Columbia Guidebook.
- Gingrich, Samuel F. 1967. Measuring and evaluating stocking and stand density in upland hardwood forests in the Central States. For. Sci. 13: 38 – 53.
- Martin, Pat. 2004. Second approximation of the deviation from potential table. Unpubl. Information Sheet. 17pp.
- Przeczek, John E. 2002. Partial Cutting Effects Study: Modeling with Prognosis^{BC} and TASS to Assess Partial Cutting Impacts on Yield in the Invermere T.S.A.. Unpubl. FIA Rep. for Slocan Forest Products Ltd. and Tembec Industries Ltd. 21 pp. + append.

APPENDIX C - BROADLEAF STOCKING STANDARDS

Stocking Standards Reference Number ¹	Target from Conifer Standards	Regeneration Guide						Free Growing Guide			
		Species	Stocking				Regen Delay	Assessment		Min. Height	
			Target	MIN pa	MIN p	MIN p Conifers		Earliest	Latest	Species	Ht (m)
		Broadleaf	(well-spaced/ha)				(Max yrs)	(yrs) ²	(yrs) ³		
	1000	Act At Ep	1600	1000	800	N/A	7	1	20	All	1.2
	1200	Act At Ep	2000	1200	1000	N/A	7	1	20	All	1.5

1 - Source - Ainsworth Central Cariboo Forest District Pulpwood Agreement 16 Stocking Standards

2 - Reduced from 12 years to 1 year.

3 - Increased from 15 years to 20 years

APPENDIX D – MIXED WOOD STOCKING STANDARDS

Stocking Standards Reference Number ¹	Target from Conifer Standards	Regeneration Guide					Free Growing Guide				
		Species	Stocking			Regen Delay	Assessment		Min. Height		
			Target	MIN pa	MIN p		MIN p Conifers	Earliest	Latest	Species	Ht (m)
		Broadleaf	(well-spaced/ha)			(Max yrs)	(yrs) ²	(yrs) ³			
	Conifer component = 41% and greater										
	1000	Act At Ep	1200	700	600	400	7	1	20	All	1.2
	1200	Act At Ep	1600	1000	800	600	7	1	20	All	1.5
	Conifer component = 31% to 40%										
	1000	Act At Ep	1300	800	650	300	7	1	20	All	1.2
	1200	Act At Ep	1700	1050	850	400	7	1	20	All	1.5
	Conifer component = 26% to 30%										
	1000	Act At Ep	1400	900	700	250	7	1	20	All	1.2
	1200	Act At Ep	1800	1100	900	300	7	1	20	All	1.5
	Conifer component = 21% to 25%										
	1000	Act At Ep	1500	950	750	150	7	1	20	All	1.2
	1200	Act At Ep	1900	1150	950	200	7	1	20	All	1.5

1 - Source - Ainsworth Central Cariboo Forest District Pulpwood Agreement 16 Stocking Standards

2 - Reduced from 12 years to 1 year.

3 - Increased from 15 years to 20 years

APPENDIX E – FSP MAP